

**REMARKS**

Reconsideration and withdrawal of the rejections of the claims, in view of the amendments and remarks herein, is respectfully requested. Claims 132, 136 and 140 are amended, claim 135 is canceled, and claims 168-169 are added. Claims 1-134 and 136-169 are now pending in this application. The amendments are intended to advance the application and are not intended to concede to the correctness of the Examiner's position or to prejudice the prosecution of the claims present prior to amendment, which claims may be in a continuing application of the above-identified pending application.

Due to the redundancy of claim 135 (two claims were numbered 135), claims 135 are canceled and reintroduced as claims 168-169.

At page 2 of the Office Action, the Examiner asserts that the claims are "directed to luciferin" or "contain luciferin". Luciferin, as noted on page 13 of the Office Action, has a particular chemical name that corresponds to a specific chemical structure. The claims under examination clearly exclude luciferin, e.g., claim 132 recites that the compound is a substrate of a cytochrome P450 enzyme and a pro-substrate of luciferase (luciferin is not a substrate of a cytochrome P450 enzyme and is a substrate, not a pro-substrate, of a luciferase), and claim 169 recites that "provided that when R<sub>1</sub> is hydroxy, R<sub>7</sub> is not hydrogen, R<sub>11</sub> is not hydroxy, R<sub>2</sub> and R<sub>3</sub> are not both carbon, and R<sub>4</sub> and R<sub>5</sub> are not both S (luciferin)"

**The Obviousness-Type Double Patenting Rejection**

Claims 132-142 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-24, 68-71 and 91 of copending U.S. application Serial No. 10/444,145. As neither the '145 application nor the present application has issued, a terminal disclaimer is not required at this time.

**The 35 U.S.C. § 112 Rejections**

Claims 132-133, 135 and 140 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement over the term "derivative". Claims 132-133, 135 and 140 were rejected under 35 U.S.C. § 112, second paragraph, as being

indefinite for the recitation “derivative”. These rejections, as they may be maintained with respect to the pending claims, are respectfully traversed.

It is Applicant’s position that one of skill in the art, in view of Applicant’s specification, would understand that Applicant was in possession of the claimed luciferin derivatives and would understand the metes and bounds of the claimed luciferin derivatives. The specification discloses that "luciferin derivative" refers to a type of luminogenic molecule or compound having a substantial structure of D-luciferin and may be a substrate of one or more cytochrome P450 enzymes and a pro-substrate of luciferase. Numerous exemplary chemical formulas for luciferin derivatives are provided in the specification. For example, claims 132 and 169 are directed to particular compounds that have structural similarities with luciferin yet include substitutions at specified positions. Also see U.S. Patent No. 5,035,999 and U.S. Patent No. 5,374,534, documents cited against the claims under § 102(b), both of which disclose luciferin derivatives. Nevertheless, to advance the application, the word “derivative” no longer appears in the claims.

Accordingly, withdrawal of the § 112 rejections over the term “derivative” are respectfully requested.

Claim 135 was rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with written description and enablement requirements. Specifically, the Examiner asserts that substituents other than R<sup>1</sup> is O; R<sup>2</sup> and R<sup>3</sup> are each C; R<sup>4</sup> and R<sup>5</sup> are each S, are not described or enabled. Claim 135 was rejected under 35 U.S.C. § 112, second paragraph, as “R<sup>1</sup>” is purportedly indefinite. These rejections, as they may be applied to claim 169, are respectfully traversed.

The second instance of claim 135 as filed clearly recites the substituents for R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup>, and it is certainly within the skill of the art in the absence of Applicant’s specification to prepare luciferin derivatives (see, for example, Branchini, Photochemistry and Photobiology, 49:689 (1989); Masuda-Nishimura et al., Letters in Applied Microbiology, 30:130 (2000); and Monsees et al., Journal of Bioluminescence and Chemiluminescence, 10:213 (1995) (all of record)). Therefore, claim 169 is supported by the specification as filed and is enabled.

Thus, withdrawal of the rejections of claim 135 under § 112, first and second paragraphs, is respectfully requested.

Claims 132-142 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for the term “luciferin” which the Examiner asserts is a trademark or tradename. This rejection is respectfully traversed.

It is Applicant’s position that the metes and bounds of the term “luciferin” would be understood by the art worker, as that term is conventionally used in the art. See, for example, Branchini, *supra*; Masuda-Nishimura et al., *supra*; and Monsees et al., *supra*.

Therefore, withdrawal of the § 112, second paragraph, rejection over the term “luciferin” is respectfully requested.

*The 35 U.S.C. § 102 Rejections*

Claims 132-135 and 140 were rejected under 35 U.S.C. § 102(b) as being anticipated by Bowie et al. (*Biochemistry*, 12:1845 (1973)). This rejection is respectfully traversed.

Bowie et al. discloses D-luciferin, dehydroluciferin and dehydroluciferol. D-luciferin, dehydroluciferin and dehydroluciferol are not structural analogs of D-luciferin, dehydroluciferin or luciferol that are modified at the 6' position (claim 132).

Claim 169 excludes luciferin, i.e., “provided that when R<sub>1</sub> is hydroxy, R<sub>7</sub> is not hydrogen, R<sub>11</sub> is not hydroxy, R<sub>2</sub> and R<sub>3</sub> are not both carbon, and R<sub>4</sub> and R<sub>5</sub> are not both S (luciferin)”, dehydroluciferin, i.e., when R<sub>1</sub> is hydrogen, R<sub>7</sub> is not hydrogen, R<sub>11</sub> is not hydroxy, R<sub>2</sub> and R<sub>3</sub> are not both carbon, and R<sub>4</sub> and R<sub>5</sub> are not both S (dehydroluciferin); and dehydroluciferol, i.e., dehydroluciferol has an additional double bond in the ring equivalent to formula (I)'s “C ring” (the five membered ring that includes R<sub>5</sub>, and the R<sub>6</sub> substituent) which is not present in the C ring of formula (I) in claim 169.

Claims 132-142 were rejected under 35 U.S.C. § 102(b) as being anticipated by claims 1-21 of U.S. Patent No. 4,826,989. This rejection is respectfully traversed

The '989 patent discloses luciferin and a dihydroxy derivative of luciferin. The disclosed derivatives in the '989 patent are not modified at the 6' position (claim 132) and do not fall within the scope of claims 136-139 and 169.

Claims 132-142 were rejected under 35 U.S.C. § 102(b) as being anticipated by claims 1-13 of U.S. Patent No. 5,035,999. This rejection is respectfully traversed.

The '999 patent discloses aminoluciferin derivatives modified at the 6' position by the addition of an amino acid, peptide or mono- or di-saccharide yielding a substrate of a protease or glycosidase. The '999 patent does not disclose a compound that is a cytochrome P450 substrate and a pro-substrate of luciferin (claim 132) or compounds within the scope of claims 136-139 and 169.

Claims 132-142 were rejected under 35 U.S.C. § 102(b) as being anticipated by claims 1-5 of U.S. Patent No. 5,098,828. This rejection is respectfully traversed.

The '828 patent discloses luciferin derivatives modified at the 6' position by the addition of a sulfatase, phosphatases, or glycosidase substrate. The '828 patent does not disclose a compound that is a cytochrome P450 substrate and a pro-substrate of luciferin (claim 132) or compounds within the scope of claims 136-139 and 169.

Claims 132-142 were rejected under 35 U.S.C. § 102(b) as being anticipated by claims 1-11 of U.S. Patent No. 5,283,180. This rejection is respectfully traversed.

The '180 patent discloses luciferin derivatives having ester alkyl or phenyl modifications that yield derivatives that inhibit that activity of organophosphates and carbamate pesticides. The '180 patent does not disclose a compound that is a cytochrome P450 substrate and a pro-substrate of luciferin (claim 132) or compounds within the scope of claims 136-139 and 169.

Claims 132-142 were rejected under 35 U.S.C. § 102(b) as being anticipated by claims 1-9 of U.S. Patent No. 5,374,534. This rejection is respectfully traversed.

The '534 patent discloses luciferin derivatives having ester alkyl or phenyl modifications that yield derivatives that inhibit that activity of organophosphates and carbamate pesticides. The '534 patent does not disclose a compound that is a cytochrome P450 substrate and a pro-substrate of luciferin (claim 132) or compounds within the scope of claims 136-139 and 169.

Claims 132-142 were rejected under 35 U.S.C. § 102(b) as being anticipated by claim 5 (formula XXVIII) of U.S. Patent No. 6,143,492. This rejection is respectfully traversed.

The '492 patent discloses compounds having the generic structure Y-L-Q wherein L is an oxyphenylmethyl linker connecting groups Y and Q, and Q can be certain generic luciferin derivatives (e.g., compound XXVIII cited by the Examiner). No specific luciferin derivatives were disclosed or described in the '492 patent. The '492 patent does not disclose any compounds, including compound XXVIII, that are cytochrome P450 substrates and pro-

substrates of luciferin that are modified at the 6' position as recited in claim 132. Additionally, the '492 patent does not disclose any compounds, including compound XXVIII, that fall within the scope of claims 136-139 and 169.

Claims 132-142 were rejected under 35 U.S.C. § 102(b) as being anticipated by claim 1 (formula XXVIII) of U.S. Patent No. 6,420,130. This rejection is respectfully traversed

The '130 patent discloses compounds having the generic structure Y-L-Q wherein L is an oxyphenylmethyl linker connecting groups Y and Q, and Q can be certain generic luciferin derivatives (e.g., compound XXVIII cited by the Examiner). No specific luciferin derivatives were disclosed or described in the '130 patent. The '130 patent does not disclose any compounds, including compound XXVIII, that are cytochrome P450 substrates and pro-substrates of luciferin that are modified at the 6' position as recited in claim 132. Additionally, the '130 patent does not disclose any compounds, including compound XXVIII, that fall within the scope of claims 136-139 and 169.

Claims 132-142 were rejected under 35 U.S.C. § 102(b) as being anticipated by claim 3 (formula XVIII) of U.S. Patent No. 6,514,687. This rejection is respectfully traversed

The '687 patent discloses compounds having the generic structure Y-L-Q wherein L is an oxyphenylmethyl linker connecting groups Y and Q, and Q can be certain generic luciferin derivatives (e.g., compound XXVIII cited by the Examiner). No specific luciferin derivatives were disclosed or described in the '687 patent. The '687 patent does not disclose any compounds, including compound XXVIII, that are cytochrome P450 substrates and pro-substrates of luciferin that are modified at the 6' position as recited in claim 132. Additionally, the '687 patent does not disclose any compounds, including compound XXVIII, that fall within the scope of claims 136-139 and 169.

Claims 132-142 were rejected under 35 U.S.C. § 102(b) as being anticipated by claims 1-10 of U.S. Patent No. 6,638,713. This rejection is respectfully traversed

The '713 patent, a child of U.S. Patent No. 6,420,130 discussed above, discloses compounds having the generic structure Y-L-Q wherein L is an oxyphenylmethyl linker connecting groups Y and Q, and Q can be certain generic luciferin derivatives (e.g., compound XXVIII cited by the Examiner). No specific luciferin derivatives were disclosed or described in the '713 patent. The '713 patent does not disclose any compounds, including compound XXVIII,

that are cytochrome P450 substrates and pro-substrates of luciferin that are modified at the 6' position as recited in claim 132. Additionally, the '713 patent does not disclose any compounds, including compound XXVIII, that fall within the scope of claims 136-139 and 169.

Therefore, withdrawal of the § 102(b) rejections of the claims is respectfully requested.

**AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111**

Serial Number: 10/665,314

Filing Date: September 19, 2003

Title: LUMINESCENCE-BASED METHODS AND PROBES FOR CYTOCHROME P450 ACTIVITY

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Dkt: 341.044US1

**CONCLUSION**

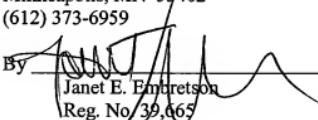
Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 373-6959 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

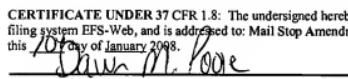
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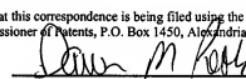
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**CERTIFICATE UNDER 37 CFR 1.8:** The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 10 day of January 2008.

  
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